NYC/EDC

COVID–19 and the New York City Economy

March 2021

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Executive Summary

Recessions can inspire governments to adjust and implement policies to ensure that future economic shocks don't cause the same devastating consequences. After the Great Recession, New York City invested heavily in diversifying its economy, which had in previous decades been over-reliant on a small number of industries. In part due to these investments, the city went on to add nearly a million private-sector jobs during the ensuing economic recovery. Yet, while job growth was high and the unemployment rate fell to historic lows, truly inclusive economic growth eluded NYC for much of the past decade.

The COVID-19 pandemic impacted both the global economy and the NYC economy in unforeseen and unprecedented ways. While the city might have been more resilient in the face of another financial crisis, many industries that were better able to weather previous economic downturns were hit hardest by COVID-19. These include typically resilient industries that play outsize roles in the city's economy, like tourism and education. But small businesses struggled too, seeing decreased revenue amid public health guidance and certain government policies—a situation amplified by the fact that these businesses generally have less cash on hand.

The worker composition of the industries hit hardest by COVID-19 meant that some of the city's most vulnerable neighborhoods faced even greater financial strain due to job losses among residents. The city's density, erroneously cited early in the pandemic as a risk factor, in fact provided some benefits; it increases the likelihood that residents can find all daily essentials within their neighborhood. At the same time, the pandemic also highlighted how essential a truly robust, citywide transit system is—for transporting essential

workers to their jobs and for transporting all New Yorkers to a vast variety of opportunities.

NYC's economic diversity can help it add jobs in the next recovery. But the City also needs to explore specific interventions to fix the issues that COVID-19 laid bare, and to correct the failings of previous recoveries. The full impact of COVID-19 is still unknown, but it's clear that the City can begin planning immediately for important steps toward recovery.

Throughout history, NYC has successfully reinvented itself to address major changes in the world's economy. In the aftermath of the Great Depression, the fiscal crisis of the 1970s, the 9/11 attacks, the Great Recession, and Superstorm Sandy, the city persevered and bounced back stronger. There is now a chance for the city to build back stronger than it was before. This paper identifies industries, neighborhoods, and occupations that have been most impacted by COVID-19. These can be the targets of efficient, innovative interventions to help reinvent the city, and keep it thriving. The economic recovery can be the engine that makes NYC's economy more inclusive, equitable, resilient, and sustainable.

Introduction

The New York City economy has evolved significantly in the last few decades, with technological innovation driving growth and sparking productivity gains across a wide range of industries. The unprecedented magnitude of the decline in employment and production heralded by COVID-19 has laid bare many flaws in existing economic and social structures. Unlike in previous recessions, job losses during this crisis have been more significant for workers with low wages. Since the downturn stems from a pandemic, understanding its impact on the economy and healthcare system remains critical for any meaningful recovery efforts. Before the COVID-19 pandemic ended a decade-long economic expansion in NYC, the city economy added 980,000 private sector jobs—about a one-third increase—between August 2009 and February 2020. However, due to poor labor market conditions and other factors, nominal wages did not increase significantly for several years.

The public health crisis and measures taken so far continue to have second-order effects. While we have seen the depth and speed of the decline caused by the virus, the exact duration of the crisis is still not clear for sectors that involve in-person engagements, e.g., restaurants, retail, tourism, and travel. Additionally, it will take some time for the scale of the eventual economic damage to be ascertained, since long-term economic impacts are difficult to measure in the face of too many unknowns. This has major implications for long-term economic recovery. One of the most significant impacts of the COVID-19 recession has been job loss. Apart from exacerbating existing inequalities, the virus's impacts and remedies are atypical. Also, considering that this is a pandemic-induced recession, sectors that were resilient in the past might be on a different trajectory this time.

Throughout history, NYC has successfully reinvented itself to address major changes in the world's economy. This paper identifies new opportunities on the surely long road to recovery, but as we navigate the uncharted waters of COVID-19, NYC's status as a global leader in finance and innovation will enable the city to reinvent itself. The pandemic presents an opportunity to shape the vision of rebuilding a more inclusive, equitable, resilient, and sustainable economy. Therefore, interventions must be truly future-oriented since their long-lasting effects have implications for intergenerational equity and justice.

To the extent that maximizing employment is the major goal of most economic recovery plans, special attention should be given to vulnerable industries and employees, while also focusing on impactful industries that are identified via metrics of concentration and multipliers. This is the focus of this report.

NYC Before and Since COVID-19

Global economic picture and forecast

The COVID-19 pandemic has radically changed the global economic outlook. The World Bank estimated a 4.3 percent contraction in global GDP in 2020, with per capita income contractions in 2020 expected to be more widespread than at any other time since 1870, and growth in developing countries at its weakest in over 60 years.[1] In its October 2020 report, the IMF estimated a 4.4 percent contraction for the year.[2] Even with the World Bank's projection of a 4 percent increase in global economic output in 2021, this would still leave global output 5 percent below pre-pandemic projections.[3]

Figure 1: Pre-pandemic NYC economic snapshot
$776B Gross City Product
$1.77T Gross Metro Product
8.3M Residents
3.1M Foreign-born residents
46 Fortune 500 companies
4.1M Private-sector jobs
3.4% Unemployment rate
1M Owner-occupied units
2.1M Renter-occupied units

Source: Moody Analytics; Census Bureau Population Estimates Program; Mayor's Office of Immigrant Affairs Annual Report 2018; Fortune 500 2019; and New York State Department of Labor

NYC's economy pre-COVID

The current recession marks the end of a decade-long economic expansion in NYC. From August 2009 to February 2020, the city added 980,000 private-sector jobs, an increase of 31.4 percent. In other ways, however, the recovery was slow and weak. Due to poor labor market conditions, worker bargaining power was low, and nominal wages did not increase significantly for several years.[4] (However, wage growth did accelerate toward the end of the decade.) The 2008 global financial crisis and accompanying recession revealed high levels of income inequality, poverty, and economic insecurity among NYC's marginalized populations.

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[1] https://www.worldbank.org/en/news/press-release/2021/01/05/global-economy-to-expand-by-4-percent-in-2021-vaccine-deployment-and-investment-key-to-sustaining-the-recovery

[2] https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/34710/9781464816123-Ch01.pdf

[4] https://www.epi.org/nominal-wage-tracker/

Citywide view – what has changed so far

COVID-19 dramatically changed NYC's economic outlook over the course of a few months. The city's unemployment rate skyrocketed from a record low of 3.4 percent in February 2020 to a record high of 20.4 percent in June. The city lost 894,000 jobs from February to April and added back only 308,000 in the following seven months. Approximately 5 percent of the city's population left the city in the first two months of the pandemic, while some of the city's wealthier neighborhoods saw close to 40 percent of residents leave.[5] Worsening economic conditions saw the City forecast a $9 billion revenue shortfall through the middle of 2021, forcing a reduction in the City's budget for fiscal year 2021.[6] Some sectors of the economy have made strides in recovering jobs that were lost: From May to November, Construction gained back 72 percent of the jobs lost in March and April, while Retail Trade regained 55 percent of the jobs lost during the same period.

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[5] https://www.nytimes.com/interactive/2020/05/15/upshot/who-left-new-york-coronavirus.html

[6] https://www.bloomberg.com/news/articles/2020-05-27/nyc-revenue-picture-worsens-with-shortfall-rising-to-9-billion

Defining Characteristics

Addressing a unique recession

The current recession is unique and unprecedented; it also differs significantly from the most recent downturn, the Great Financial Crisis of 2008–09. Globally, some of the countries that have seen stronger economic recoveries are those that have gone on to manage to control the pandemic most effectively.[7] While most recessions have historically been characterized by a relatively quick, "V-shaped" recovery, financial crises are typically followed by slower recoveries.

The unique nature of the current economic situation has caused some to term the economic recovery a "K-shaped" recovery—one in which there is a divergence in fortunes between two sets of people.[8] A K-shaped recovery would exacerbate economic inequality, which has been growing for the past few decades in the US.[9] In the aftermath of a financial crisis, individuals and institutions tend to face large debt burdens that make it less likely that they will borrow, spend, or invest.[10] However, the current crisis has been characterized by higher borrowing, saving, and spending than might have otherwise been seen during a recession,[11] [12] due to factors such as low interest rates and the $2.2 trillion Coronavirus Aid, Relief, and Economic Security (CARES) Act.

Differentiating characteristics of the COVID-19 downturn

While no two recessions are the same, the current COVID-19-induced recession is particularly unparalleled in both its depth and speed. Both factors are driven by the root cause of the recession—a global pandemic that led to the shutdown of many businesses due to public health concerns. According to data from Indeed, nationwide job postings saw continuous improvement relative to 2019 levels after a May 2020 trough, though improvements slowed in August, and through October, postings were 14 percent below the 2019 trend.[13]

7   https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

8   https://www.fastcompany.com/90549147/forget-u-or-v-or-w-we-may-be-headed-toward-a-k-shaped-recovery

9   https://www.cnbc.com/2020/10/23/coronavirus-is-exacerbating-economic-inequality-in-the-us.html

10 https://www.gsb.stanford.edu/insights/why-was-last-recovery-slower-usual-actually-it-wasnt

11 https://www.cnbc.com/2020/10/23/coronavirus-is-exacerbating-economic-inequality-in-the-us.html

12 https://rooseveltinstitute.org/wp-content/uploads/2020/10/RI_-RecoveringandStructuringAfterCOVID19_IssueBrief_202010.pdf

13 https://www.hiringlab.org/2020/11/05/job-postings-through-oct-30/
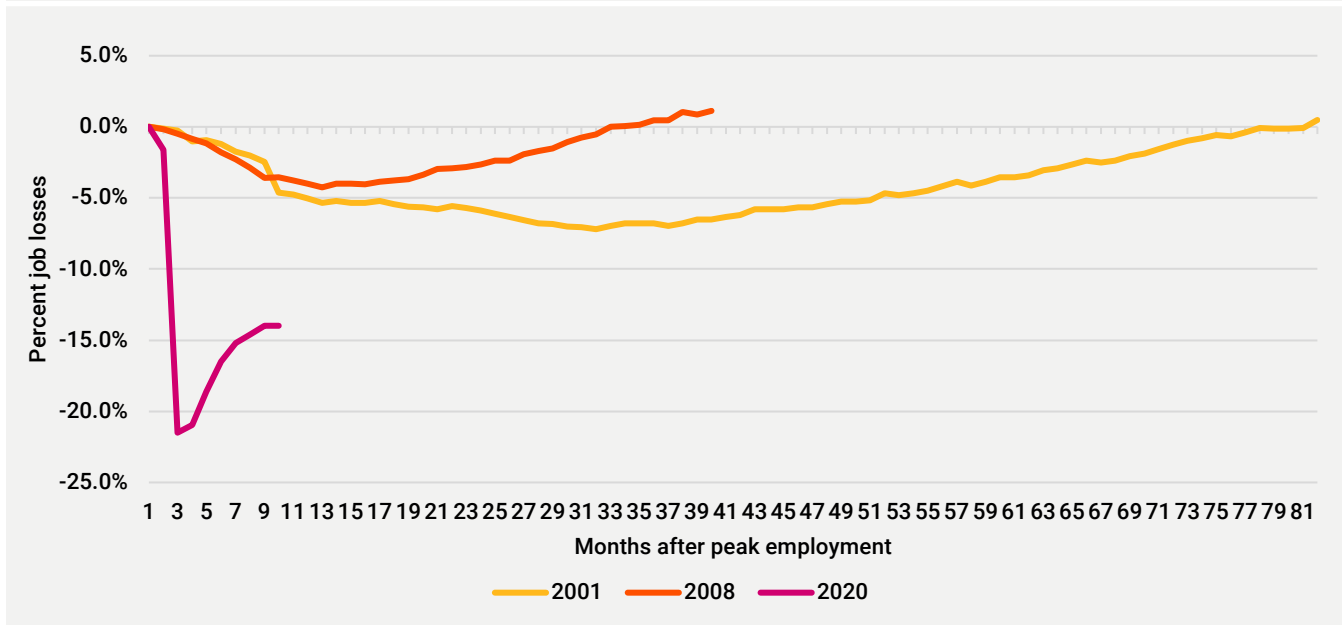
Source: Current Employment Statistics, NYSDOL, data seasonally adjusted by OMB

The pandemic has resulted in a dual public health and economic crisis. Further progress in the economic recovery will go hand-in-hand with progress in containing and reducing the spread of the virus.

Risk Factors and Impacts

Density, crowding, and other risk factors

From the beginning of the COVID-19 pandemic, there was a perception that NYC's density determined its destiny in being an early epicenter of the virus.[14] However, analyzing the pattern of the spread of COVID-19 reveals other more significant risk factors. Studies have revealed the unequal burden of COVID-19 on low-income populations, who are more likely to be people of color, living in crowded multi-generational households, heavily reliant on public transit, less likely to have internet access, and less likely to work from home.[15]

Further countering the perception around density, many rural and suburban communities in the US went on to record high infection rates, despite seeing lower rates earlier in the pandemic. There also were low infection rates in a number of densely populated cities in East and Southeast Asia.

Notably, the existence of a strong correlation between crowding and COVID-19 cases suggests how different socioeconomic groups are affected.[16] Analysis of American Community Survey data reveals that minorities made up roughly 69 percent of the population in the 10 most crowded NYC neighborhoods.[17] This proportion drops to 43 percent among the 10 least crowded neighborhoods, further suggesting inequalities among various NYC populations. In addition, further correlation analysis from NYCEDC suggests that income is a strong determinant in how a community is affected by the pandemic. An increase in the median income of a neighborhood is associated with a corresponding decline in the case rate (Table 1).

Table 1. Number of positive cases and median income brackets per NYC zip code.

Income bracket	ZCTA count*	Confirmed cases	Percent positive	Cases per 100,000
Less than $50,000	40	84,584	10.0%	3,379
$50,000 to $74,999	72	121,029	9.7%	3,321
$75,000 to $99,999	33	35,486	8.1%	2,901
$100,000 to $124,999	17	9,808	3.9%	1,698
$125,000 to $149,999	10	5,578	3.7%	1,590
$150,000 and higher	7	502	3.4%	1,356
Total	179	256,987	8.7%	3,083

*ZCTA – ZIP Code Tabulation Area
Source: NYC Department of Health and Mental Hygiene; accurate as of 11/11/2020.

[14] https://www.nytimes.com/2020/03/23/nyregion/coronavirus-nyc-crowds-density.html

[15] "COVID-19 Cases in New York City, a Neighborhood-Level Analysis," NYU Furman Center, April 10, 2020, https://furmancenter.org/thestoop/entry/covid-19-cases-in-new-york-city-a-neighborhood-level-analysis.

[16] Yu Zhong and Bertrand Teirlinck, "Density and its Effect on COVID-19 Spread," NYCEDC, October 2020, https://edc.nyc/density-and-its-effect-on-covid-19-spread.

[17] Minority defined as all population that does not identify as "White Alone."

Further analysis also reveals similar findings when an area's general educational attainment is considered: As the educational attainment rises, case rate falls. These findings are consistent with borough-level analysis—Manhattan has higher levels of education and income and has fewer confirmed cases relative to other boroughs (Table 2). This points to the fact that higher-income populations—often more educated than lower-income ones—are more often able to work from home and, in some cases, move to a second home during the crisis.

NYC data highlight the importance of wealth and socioeconomic status in navigating a health crisis such as this one, along with the importance of the City's ongoing effort to foster an inclusive economic recovery that addresses existing systemic inequalities.

Table 2: Confirmed COVID-19 cases in NYC (as of September 25, 2020)

Borough	Persons/sq. mile (2019 est.)	Percentage of positive tests	Case rate per 100,000 people
The Bronx	34,078.20	12.80%	3,625.90
Staten Island	8,157.90	12.10%	3,236.00
Queens	21,088.30	11.70%	3,056.50
Brooklyn	36,470.30	9.60%	2,473.10
Manhattan*	56,485.10	5.80%	2,302.70
* Assumes 20% population outflow for Manhattan			

Source: Demographics from U.S. Census Bureau; Cases data from NYC Department of Health and Mental Hygiene

A recent World Bank article[18] argues that urban density could be a blessing when it comes to fighting the virus—that, in fact, crowding, income, race/ethnicity, and educational attainment are equally important in determining the transmission mechanism.[19] This resonates when we consider how dense urban communities support high-quality infrastructure that can provide faster emergency response times during a crisis. In addition to better hospital staffing and a greater concentration of intensive-care beds and other healthcare resources, density also makes neighborhoods more resilient during disasters, offering alternative services either within walking distance or through delivery services when travel becomes an issue.

Impact on higher education

Universities around the country were forced to order two-week lockdowns shortly after opening for the 2020–2021 school year; the future of in-person, on-campus instruction remains unclear, with major implications for universities and businesses across the world. The city's private colleges and universities employ over 90,000 people and have a total payroll of over $9 billion.[20] The public City University of New York (CUNY) system employs over 45,000 staff. Over 600,000 students are enrolled in a college or university in NYC at the

[18] https://blogs.worldbank.org/sustainablecities/urban-density-not-enemy-coronavirus-fight-evidence-china
[19] https://www.washingtonpost.com/health/income-emerges-as-a-major-predictor-of-coronavirus-infections-along-with-race/2020/06/22/9276f31e-b4a3-11ea-a510-55bf26485c93_story.html
[20] BLS, Quarterly Census of Employment and Wages, 2019

undergraduate, graduate, or professional level.[21] While higher education didn't suffer acutely during the Great Recession, COVID-19 has raised many difficult questions for higher education in NYC, an ecosystem that largely relies on the sharing of indoor space for living, learning, teaching, and working.

Impact on tourism

Tourism is a $70 billion industry in NYC—67 million people visited the city in 2019, capping 10 consecutive years of growth.[22] Shutdown orders in March 2020 closed off much of the city's tourism economy, including restaurants and bars, hotels, museums, and Broadway. While the March shutdown orders were driven by the COVID-19 spike in NYC itself, the City also imposed quarantine orders in subsequent months on visitors from designated states with high rates of COVID-19 infection.[23]

Efforts to spur tourism in the short term will, by necessity, focus on people living in the New York area.[24] According to a December 2020 estimate by NYC & Company, tourism will end up having fallen to 22.9 million visitors in 2020, a 66 percent drop from 2019.[25] A strong resurgence of the city's tourism industry is important from an equity perspective as well. In the Accommodation and Food Services industry, which benefits greatly from visitors to the city, 78.3 percent of workers are people of color, compared to 59.8 percent of workers citywide.

Figure 3. Total visitors to NYC, 2017−2019

■ Domestic Visitation (millions)   ■ International Visitation (millions)
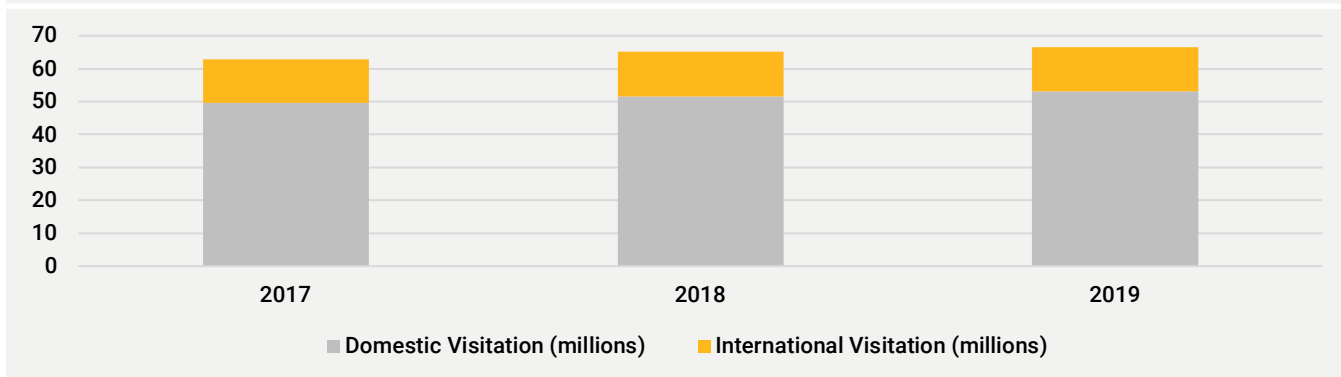
Source: NYC & Company

Impact on small business

The virus has disproportionately affected a wide array of small businesses—a key feature of NYC's economy, accounting for about 95 percent of all businesses (Figure 4). Further, small businesses are largely labor-intensive and generally have low cash on hand, making them most vulnerable to situations of low or no revenue.

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[21] US Census Bureau, American Community Survey, 5-year estimates 2014-2018

[22] https://www.washingtonpost.com/national/when-will-new-york-reopen-to-tourists/2020/05/15/981bfb0e-939a-11ea-82b4-c8db161ff6e5_story.html

[23] https://www.nycgo.com/coronavirus-information-and-resources-for-travelers

[24] https://www.nytimes.com/2020/07/24/nyregion/nyc-tourism-coronavirus.html

[25] https://www.ny1.com/nyc/all-boroughs/news/2020/12/03/this-is-what-tourism-looks-like-in-nyc-right-now

One of the most significant economic impacts of the COVID-19 recession has been job loss and, unlike in previous crises, job losses during this pandemic-induced recession have been more significant for low-wage workers. The concomitant labor market polarization has major implications. The more inequality that exists in an economy, the less likely it is for economic growth alone to sufficiently lift up those at the bottom.

Figure 4: NYC small business employment by industry
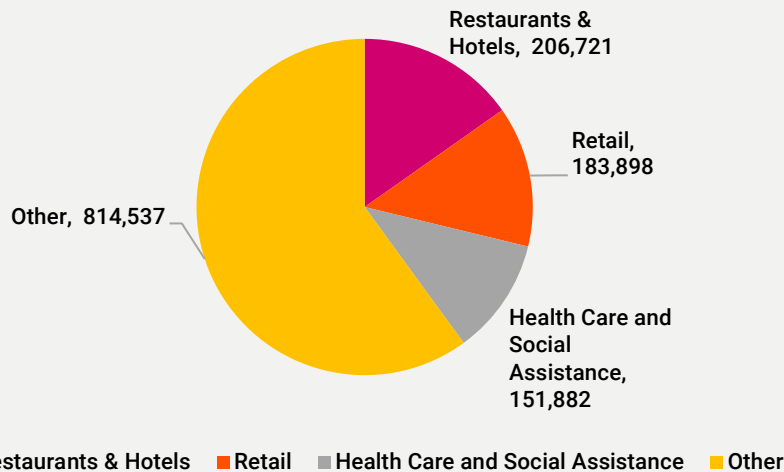
Source: NYCEDC and NYC QCEW public and microdata

While small businesses are important to the city's economy from a payroll and jobs perspective, they are also an important component of an inclusive recovery from an equity perspective. Among others, uncertainty and structural factors perpetuate wage depression in the aftermath of a recession. The cyclicality of the labor share of output, especially following a recession, has received considerable attention in the literature.[26]

Contemporary evidence on the labor market effects of the pandemic, along with changes in labor costs, shows that low-wage, essential workers are worse off.[27] [28] [29] Over the last five decades, economic activity in the US has gradually moved from small, often labor-intensive businesses, to large, capital-intensive ones (Figure 5). While this shift has been one of the key drivers of income and wealth inequality over the years, it is often not within a typical firm. This has led to the emergence of "superstar firms" with market power in key sectors of the economy—firms like "big box" retailers and large tech companies.[30]

[26] https://www.brookings.edu/bpea-articles/the-decline-of-the-u-s-labor-share/

[27] https://www.bls.gov/covid19/effects-of-covid-19-pandemic-on-productivity-and-costs-statistics.htm

[28] https://www.bls.gov/opub/mlr/2020/article/covid-19-shutdowns.htm

[29] https://www.brookings.edu/research/the-initial-impact-of-covid-19-on-labor-market-outcomes-across-groups-and-the-potential-for-permanent-scarring/

[30] David Autor, David Dorn, Lawrence F Katz, Christina Patterson, John Van Reenen, "The Fall of the Labor Share and the Rise of Superstar Firms," The Quarterly Journal of Economics, Volume 135, Issue 2, May 2020, Pages 645–709, https://doi.org/10.1093/qje/qjaa004

Figure 5: Share of labor compensation in GDP in the US
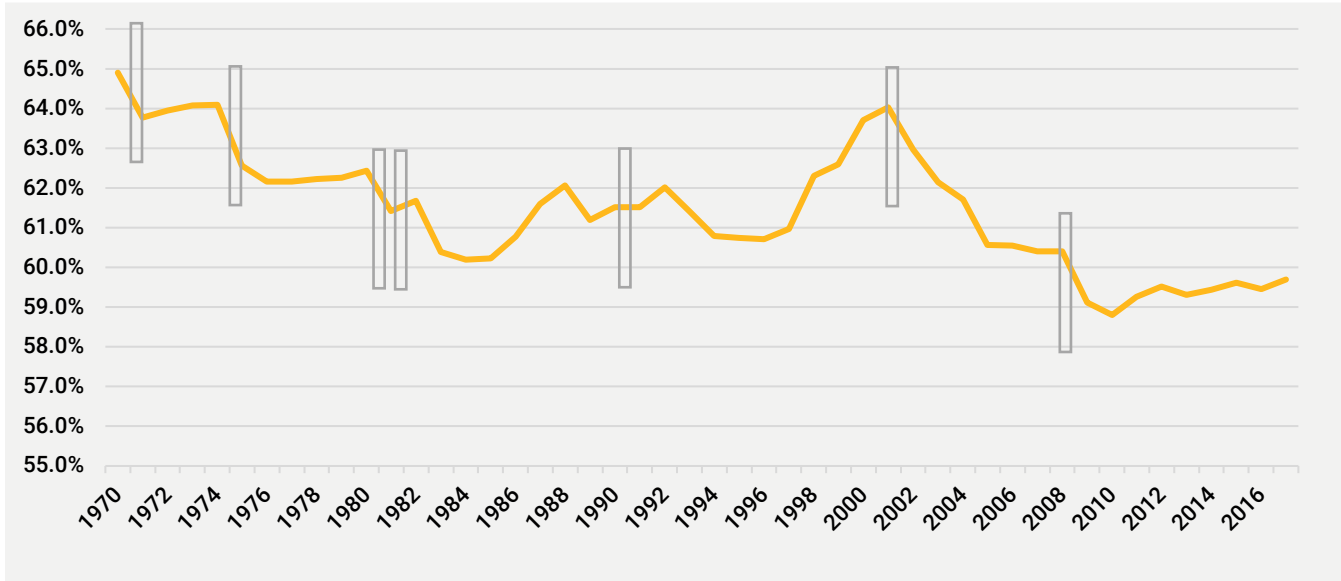
Source: Federal Reserve Bank of St. Louis; bars indicate approximate start dates of US recessions

If maximizing employment is a goal of the economic recovery, then it follows that efforts should focus on particularly vulnerable industries and/or those that might merit government aid, either due to low cash on hand or a high number of essential workers.

Special attention should be accorded to vulnerable industries (identified via metrics of business resiliency like cash on hand and metrics of COVID-19 impacts) and vulnerable employees (lower-wage earners in less-vulnerable industries). At the same time, there should be a focus on impactful industries (identified via metrics of employment/businesses supported and small business concentration, along with economic multipliers and other modeling tools like RIMS[31] and REMI[32]).

[31] Regional Input-Output Modeling System

[32] Regional Economic Models, Inc.

Based on these criteria, the following industries emerge as potential priorities for targeted relief:

Industry	Vulnerability	Impact
Non-grocery Retail (NAICS codes 441-444 & 447-453)	Outlier in terms of low cash on hand (19 days median); COVID-19 impacts are significant due to public health guidance, government policies, reduced tourism	Relatively large industry—nearly 15,200 small businesses employ over 55,800 NYC workers; industry skews heavily towards small businesses, and it is an impactful industry (8.1-12.6 jobs per $1 million demand shock)
Restaurants (NAICS code 722)	Lowest cash on hand (16 days median nationwide); severe demand slump	20,900 small businesses employ nearly 195,000 workers; $1 million demand shock supports 15.5 jobs
Social Assistance (NAICS code 624)	Generally serves a financially vulnerable population	4,900 small businesses employ nearly 52,000 workers; $1 million demand shock supports 15.3 jobs
Personal Services (NAICS code 8121)	Low cash on hand (national median 21 days)	6,300 small businesses employ nearly 25,600 workers; $1 million demand shock supports 21.7 jobs
Fitness and Recreation Businesses (subset of NAICS code 7139)	Revenues highly impacted by COVID-19	1,000 small businesses employ about 11,200 workers; $1 million demand shock supports 12.8 jobs
Laundromats and Dry Cleaners (NAICS code 8123)	Low cash on hand (national median 23 days)	2,770 small businesses employ about 8,400 workers; $1 million demand shock supports about 14.5 jobs
Repair Workers for Household Appliances (NAICS code 811)	Low cash on hand (national median 18 days)	3,100 small businesses employ about 13,800 workers; $1 million demand shock generates 8.4 to 11.4 jobs
Taxi Workers (NAICS code 48531)	Large demand slump due to public health guidance and COVID-19 policies	87 small businesses employ over 3,500 workers; $1 million demand shock generates about 13.6 jobs
Hotels (NAICS code 721)	Low cash on hand (16 days median); significant demand slump due to COVID-19; NYC occupancy fell from above 90% to 15%	Largely dominated by bigger hotels; 660 small hotels employ over 12,000 workers; $1 million demand shock generates about 9 jobs
Doctor and Dentist Offices (NAICS code 621)	Decrease in discretionary visits due to COVID-19	14,700 small businesses employ nearly 83,000 workers; $1 million demand shock generates about 9.8 jobs

"Street level retail" (in addition to hotels, social assistance organizations, and low-wage workers in doctor and dentist offices) is a compelling yet simple framework for thinking about businesses facing the largest likely revenue declines and meriting priority City assistance. We provide a "street level retail" definition by NAICS code in Appendix I.

Measuring vulnerability: business resiliency metrics

In an attempt to measure vulnerability for small businesses, we build upon JP Morgan Research Institute's 2016 report "Cash is King: Flows, Balances, and Buffer Days" to identify less resilient industries.[33] We highlight four industries that have relatively low levels (in dollar- and day- terms) of cash on hand.

[33] https://www.jpmorganchase.com/content/dam/jpmc/jpmorgan-chase-and-co/institute/pdf/jpmc-institute-small-business-report.pdf

Table 3: Cash-on-hand analysis

	# of small businesses in NYC	Median daily outflow	Median cash on hand	Median days of cash on hand
Construction	12,447	$473	$11,545	20
Health Care Services	20,795	$623	$21,147	30
High-Tech Manufacturing	283	$967	$36,900	32
High-Tech Services	4,275	$404	$15,537	33
Metal & Machinery	2,213	$809	$26,434	28
Other Professional Services	21,923	$398	$15,213	33
Personal Services	10,394	$233	$5,718	21
Real Estate	19,556	$269	$15,105	47
Repair & Maintenance	9,723	$293	$6,366	18
Restaurants & Hotels	21,575	$1,033	$17,263	16
Retail	29,684	$441	$10,250	19
Wholesalers	12,794	$699	$19,960	23
Other Industries	52,330	N/A	N/A	N/A
Total	217,992	$404	$13,055	27

Note: Business counts are NYC-specific using Quarterly Census of Employment and Wages (QCEW) data. Daily outflow, cash on hand, and days of cash on hand are national level data from JP Morgan Research Institute inflated to 2020 dollars.

Measuring impact: employment and business metrics

Below is a high-level picture of private employment in NYC by industry, with smaller industries omitted for brevity. This reveals industries with the highest number of small businesses or highest levels of employment at small businesses: Accommodation and Food Services, Retail Trade, and Other Services (think personal services like salons and barbers). The Health Care and Professional, Scientific, and Technical Services industries are large industries, but they pay relatively higher wages. So, targeted interventions aimed at industries with lower-wage workers (or supporting employers to retain low-wage employment) may be more beneficial.

Table 4: NYC private employment by industry

2 Digit NAICS Code and Description	Total number of establishments	Total number of employees	Total number of small establishments	Total number of employees at small establishments
23: Construction	14,702	153,517	12,447	77,709
42: Wholesale Trade	14,673	131,483	12,794	76,729
44–45: Retail Trade	32,843	344,163	29,684	183,898
52: Finance and Insurance	12,258	330,183	10,400	94,049
53: Real Estate and Rental and Leasing	21,287	132,799	19,556	94,863
54: Professional, Scientific, and Technical Services	30,688	399,267	25,148	143,457
62: Health Care and Social Assistance	24,153	714,329	20,795	151,882
72: Accommodation and Food Services	24,629	367,196	21,575	206,721
81: Other Services (except Public Administration)	36,409	174,942	33,528	117,765
NYC Private Sector Totals	252,422	3,679,840	217,992	1,357,038

Note: Industries with fewer than 50,000 employees at small establishments have been omitted.
Source: Quarterly Census for Employment and Wages (QCEW), NYC public and microdata.

Measuring impact: economic multiplier metrics

The table below shows the total employment effects (direct + indirect + induced) of a $1 million positive demand shock. It is worth noting that Social Assistance includes Individual and Family Services; Community Food and Housing, and Emergency and Other Relief Services; Vocational Rehabilitation Services; and Child Day Care Services. Code 485 includes taxi drivers, and code 713 includes fitness and recreation facilities and bowling alleys.

Table 5: Employment multipliers

NAICS code & industry description	Jobs created per $1M industry purchase
722: Food services and drinking places	15.51
624: Social assistance	15.34
485: Transit and ground passenger transportation	13.61
445: Food and beverage stores	13.29
623: Nursing and residential care facilities	13.28
713: Amusement, gambling, and recreation industries	12.77
452: General merchandise stores	12.59
561: Administrative and support services	12.40
711, 712: Performing arts, spectator sports, museums, and related activities	12.14
611: Educational services	11.93

Note: The high multiplier industry of "forestry, fishing, & related activities" are excluded due to the very small size of the industry.

Essential vs. non-essential
Essential employment in NYC – strict definition

Another potential reason for companies or industries to be considered for targeted aid is having large numbers of essential workers. Using New York State Executive Order 202.6 (as of March 25, 2020) as a guideline to estimate the types of businesses and employees deemed essential, NYC's Department of City Planning (DCP) assembled a list of NAICS codes deemed essential. Based on NYCEDC's analysis, using QCEW data from 2019: Q3, 128,199 private businesses meet the strict definition of "essential" and those firms employ 2.2 million NYC workers.

The specific codes deemed essential by DCP can be found in Appendix II.

Essential employment in NYC – "common sense" definition

Building on the work above, NYCEDC developed a set of assumptions about what industries meet the "common sense" definition of "essential" private employment. The DCP framework is used as the baseline, with further adjustments based on professional judgment and research. NYCEDC estimates[34] that 93,541 private businesses meet the "common sense" definition of "essential," and those firms employ 1.7 million NYC workers.

Regardless of the definition of "essential," it is clear that a large portion of the NYC workforce should be considered for targeted aid as part of the city's recovery.

Specific codes and industries deemed essential, and differences between the two methodologies, are outlined in detail in Appendix II.
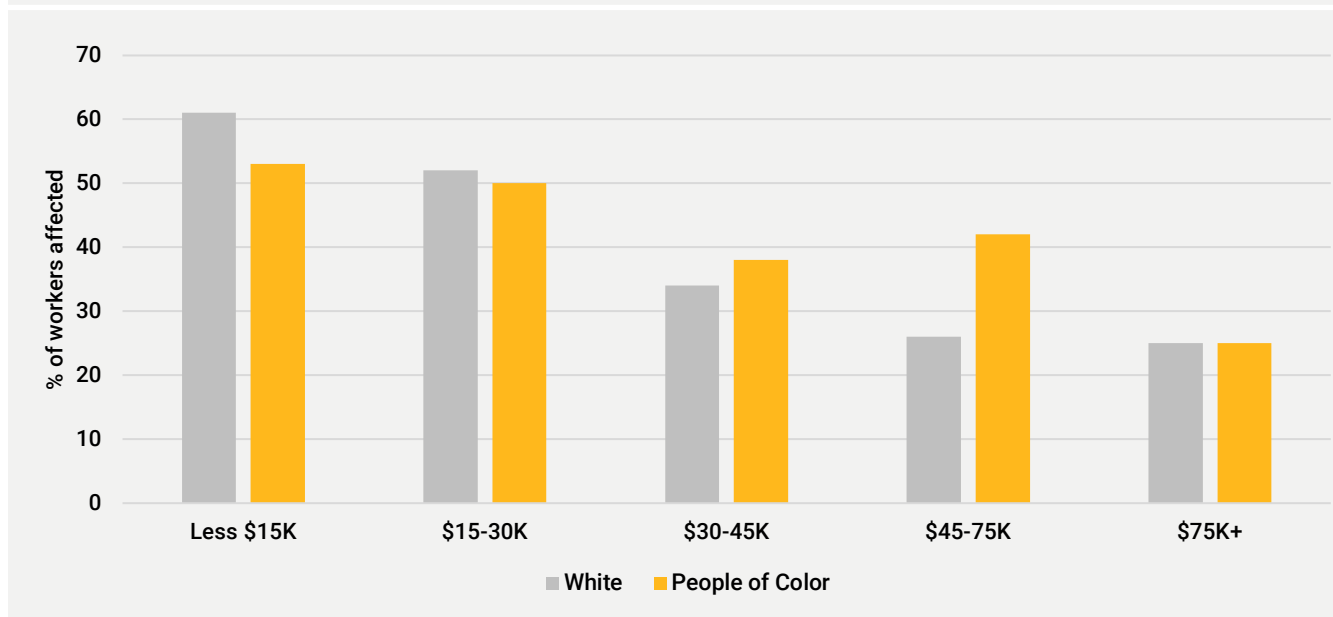
Demographic data on COVID-19 impacts
Income loss by race and gender

Research has highlighted disproportionate income losses for middle-income Black and Hispanic Americans, compared to white Americans. University of Chicago's National Opinion Research Center published findings from a survey administered to a representative sample of the US population and found that 42 percent of people of color earning an income of $45,000 to $75,000 experienced income loss, compared to just 26 percent of white Americans in the same income range.[35]

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[34] Our approach dives deeper into the 4-digit sectors and refines existing assumptions. We believe consumer spending on durable goods like automobiles and home appliances is likely to decline in the coming months, as households defer purchases until the economic crisis is over. Therefore, it is likely that firms in Sector 4236—Household Appliances and Electrical and Electronic Goods Merchant Wholesalers—might have pared back workforces to maybe 50 percent of normal levels. This exercise is conducted for each 4-digit sector in Sector 42.

[35] https://www.chicagobooth.edu/research/rustandy/blog/2020/how-are-americans-coping-with-the-covid19-crisis-7-key-findings

% of workers affected

White ▪ People of Color ▪

Source: University of Chicago Poverty Lab

Communities of color can less afford to face the health and income effects of COVID-19 in NYC. Across the five boroughs, people of color are less likely to have health insurance (Table 6) and more likely to be rent-burdened (Figure 7).
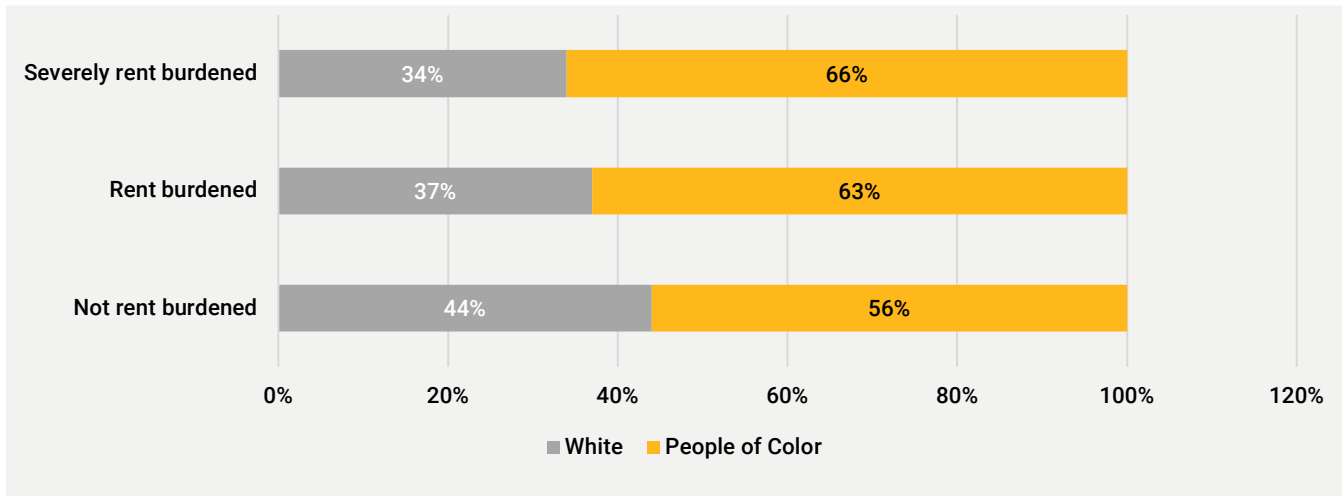
COVID-19 may also accelerate a shift in the skills demanded in the labor market—toward skills that are correlated with higher education. This shift in demanded skills will also likely impact male and female workers differently. High- and middle-wage-earning women are more likely to hold a college degree than men (63 percent to 53 percent in NYC), and therefore, women may have an easier transition into new middle- and high-wage employment opportunities than men will.

Table 6: Health insurance: uninsured rates by borough and race

Percent uninsured	The Bronx	Brooklyn	Manhattan	Queens	Staten Island
Civilian noninstitutionalized population	9.70%	8.20%	5.80%	10.50%	4.90%
Race and ethnicity					
White, Non-Hispanic	5.6%	5.4%	3.1%	5.2%	2.9%
Black or African American alone	8.3%	7.9%	7.3%	7.3%	5.9%
American Indian and Alaska Native alone	9.4%	14.1%	13.6%	13.6%	5.8%
Asian alone	6.8%	7.4%	5.5%	12.0%	6.2%
Some other race alone	12.8%	19.6%	12.0%	17.9%	13.2%
Two or more races	6.8%	6.6%	9.0%	7.6%	4.4%
Hispanic or Latino (of any race)	11.1%	14.7%	9.9%	16.2%	10.5%

Source: ACS 2018 5-year estimates

Figure 7: People of color represent a higher share of rent-burdened NYC residents

Category	White	People of Color
Severely rent burdened	34%	66%
Rent burdened	37%	63%
Not rent burdened	44%	56%

■ White ■ People of Color

Source: ACS 2018 5-year estimates

Women's labor is less volatile overall compared to men's labor. 40 percent of women and only 20 percent of men work in Government and Education and Health Services, where employment is countercyclical to the business cycle. The most cyclical sectors, Manufacturing, Construction, and Trade, Transportation, Utilities, account for 46 percent of male employment and 24 percent of female employment.[36]

The combination of higher education attainment and less volatile sector employment will likely offer women protections as jobs become more automated. This is supported by McKinsey Global Institute's future of work analysis, which predicts men being displaced at slightly higher rates than women and women being able to capture a greater percentage of new jobs.[37] However, women have not been unaffected by the economic impacts of COVID-19. With social distancing rules in effect, many New Yorkers are trying to balance telecommuting with unpaid work (like cooking and childcare), and these responsibilities likely are disproportionately falling on women. One survey by Morning Consult found that 70 percent of women say they're fully or mostly responsible for housework during lockdown, and 66 percent say so for childcare.[38] A Boston Consulting Group survey in April 2020 found that US parents have nearly doubled the time spent on education and household tasks, from 30 to 59 hours, and women are taking on a greater share of the additional time.[39] The University of Chicago researchers also found that women are facing income loss at similar rates of incidence as men, with lower earners facing higher probabilities of income loss.[40]
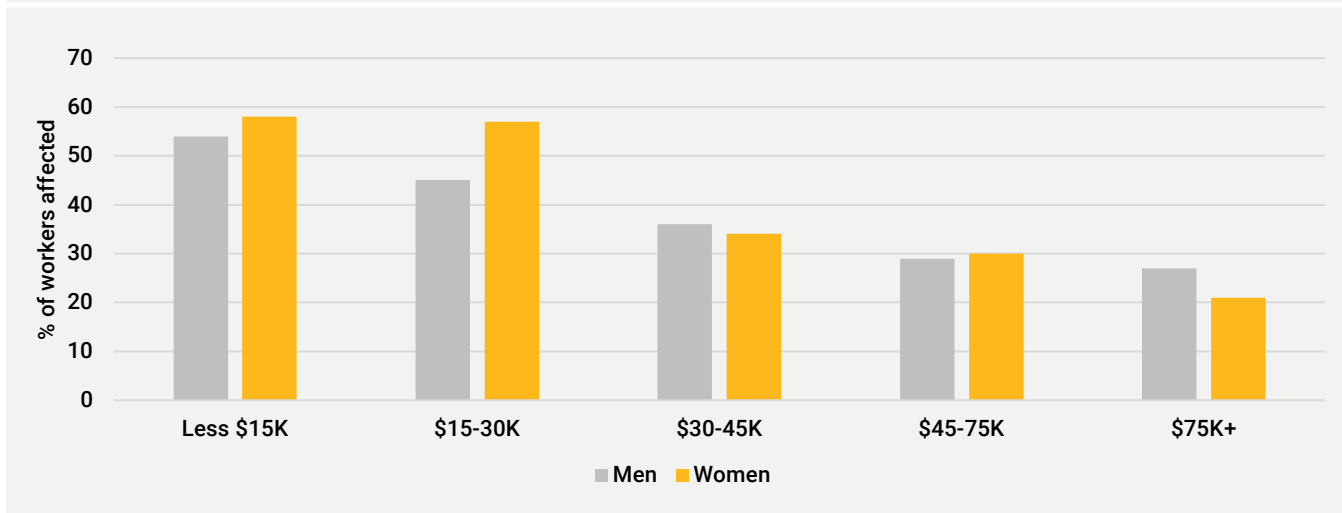
[36] Ibid

[37] McKinsey Global Institute "Future of Work in America" pg. 67

[38] https://www.nytimes.com/2020/05/06/upshot/pandemic-chores-homeschooling-gender.html

[39] https://www.bcg.com/en-us/publications/2020/helping-working-parents-ease-the-burden-of-covid-19

[40] https://www.chicagobooth.edu/research/rustandy/blog/2020/how-are-americans-coping-with-the-covid19-crisis-7-key-findings

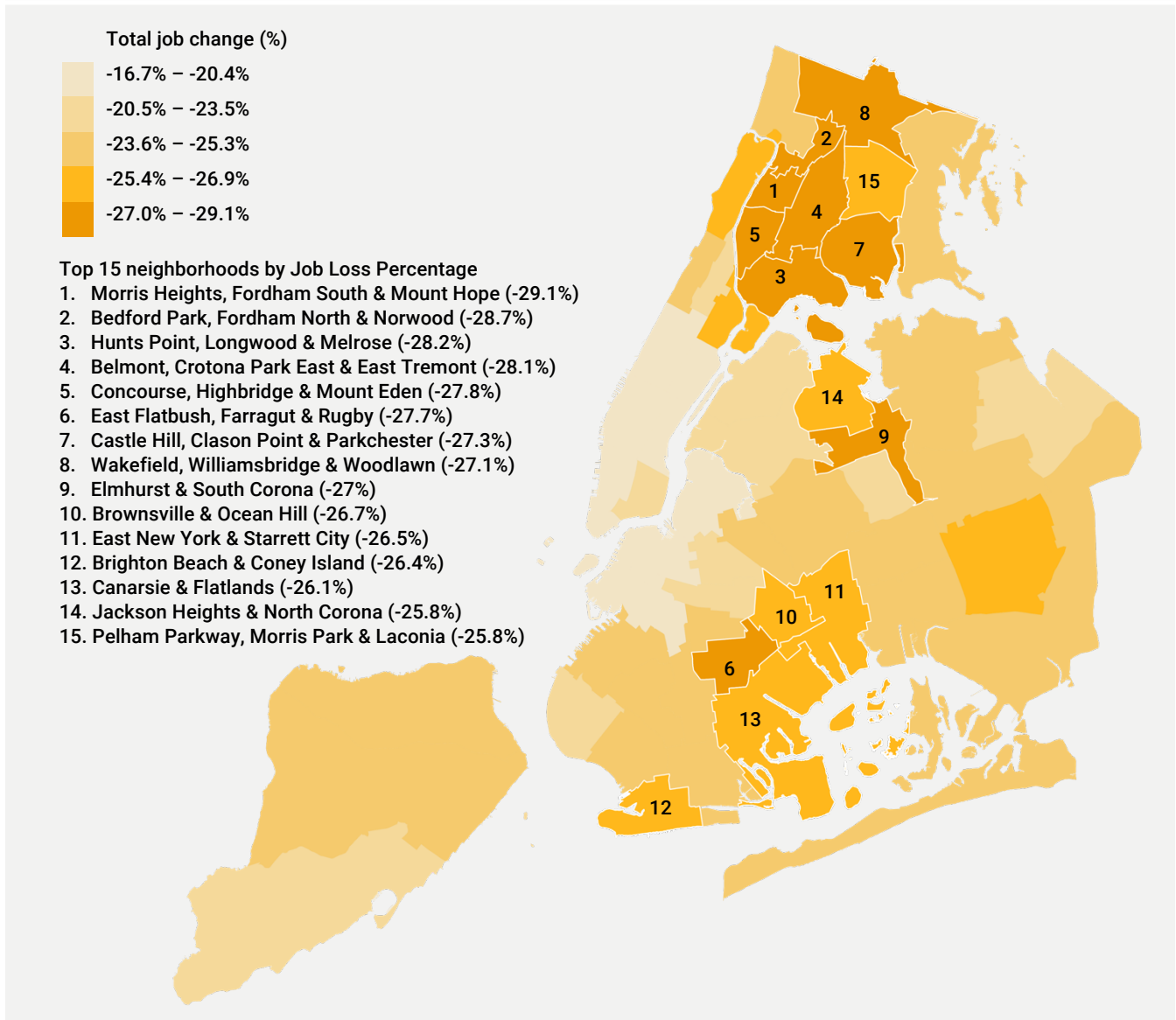**Figure 8: Income loss due to COVID-19, by gender, US**

Source: University of Chicago Poverty Lab

Geographic distribution of workers in most at-risk industries

Within NYC, some neighborhoods have faced a higher burden due to COVID-19, both in the form of health impacts and economic losses. The same is true if we forecast losses in resident employment by neighborhood over the next few years. To conduct this analysis, we created a citywide forecast of cumulative employment losses by industry for the years 2020 to 2024. We then imputed the citywide results at a neighborhood level (using Public Use Microdata Area, or PUMA), based on each PUMA's breakdown of resident employment by industry. In part, though forecasting employment loss only by industry, this map reflects where the people live who work in industries that have been hardest hit by COVID-19. Of the 15 PUMAs projected to have the largest cumulative job losses, eight are in the Bronx, five are in Brooklyn, and two are in Queens. Figure 9 shows job loss projections by PUMA; the 15 PUMAs with the highest projected job losses are highlighted. A 2020 report by Opportunity Insights found that job losses at NYC small businesses were largest for firms in affluent areas, due to reduced spending in these areas. Low-income earners working in high-income neighborhoods were most likely to lose their jobs, resulting in the vulnerability of affluent neighborhoods spreading to other parts of the city.[41]

[41] https://opportunityinsights.org/wp-content/uploads/2020/06/tracker-summary.pdf

Total job change (%)
- -16.7% − -20.4%
- -20.5% − -23.5%
- -23.6% − -25.3%
- -25.4% − -26.9%
- -27.0% − -29.1%

Top 15 neighborhoods by Job Loss Percentage
1. Morris Heights, Fordham South & Mount Hope (-29.1%)
2. Bedford Park, Fordham North & Norwood (-28.7%)
3. Hunts Point, Longwood & Melrose (-28.2%)
4. Belmont, Crotona Park East & East Tremont (-28.1%)
5. Concourse, Highbridge & Mount Eden (-27.8%)
6. East Flatbush, Farragut & Rugby (-27.7%)
7. Castle Hill, Clason Point & Parkchester (-27.3%)
8. Wakefield, Williamsbridge & Woodlawn (-27.1%)
9. Elmhurst & South Corona (-27%)
10. Brownsville & Ocean Hill (-26.7%)
11. East New York & Starrett City (-26.5%)
12. Brighton Beach & Coney Island (-26.4%)
13. Canarsie & Flatlands (-26.1%)
14. Jackson Heights & North Corona (-25.8%)
15. Pelham Parkway, Morris Park & Laconia (-25.8%)

Source: New York City Health Department COVID-19 Data; NYCEDC Economic Research & Policy COVID Scenario Modeling of 2020−2024

What does this mean for equity and inclusion in NYC?

Clearly, COVID-19 has perpetuated and deepened existing inequalities. The overarching trend for the past 50 years of industry consolidation and falling labor share of income is likely to continue or accelerate during this crisis. As such, practices that favor economic activity reallocation with asymmetric, distortionary impact on labor's share of output can only exacerbate existing gaps. Policy interventions must prevent a further erosion of labor's share of GDP, and the concomitant increase in inequality. One way to address this inequality in the labor market is to provide tax incentives that augment or protect labor, rather than predominantly subsidizing investment in capital. Another potential intervention is to advocate for improvement in worker benefits, including improved childcare, improved paid leave options, and consistent scheduling practices.

Sustainability

What COVID-19 has revealed about the environment and economy

The COVID-19 pandemic has drastically slowed down the global economy, and if there is a silver lining, it is the fact that the world's carbon footprint is significantly diminished as a result. Emissions of nitrogen dioxide, for example, have dropped 20–40 percent in cities in China, Europe, and the US.[42] The visible difference between the pre-COVID world and the world of the pandemic shines a harsh light on just how unsustainable pre-pandemic emissions were.

The United Nations Environment Programme predicts that even if all commitments under the Paris Agreement are implemented, global temperatures will rise by 3.2 degrees Celsius by 2100.[43] Just as COVID-19 has magnified global inequality, future pandemics and catastrophic weather events triggered by climate change would disproportionately hurt the poor.[44] Within the US, there are racial disparities in air pollution exposure—non-Hispanic whites experience 17 percent less air pollution exposure than is caused by their own consumption, while Blacks and Hispanics experience 56 percent and 63 percent excess exposure, respectively, relative to their consumption.[45]

Recent evidence shows how housing policy also has played a role in creating disparities in the temperatures felt by different neighborhoods within the same city. In the New York area, neighborhoods that were "redlined" by the federal government in the 1930s today face summer temperatures that are 1.6 degrees above the area average, while A-graded "best" neighborhoods per the 1930s guidelines today experience summer temperatures 4.2 degrees lower than the area average. Redlined neighborhoods tend to have fewer trees and more paved surfaces.[46]

Potential policies to address sustainability goals

It is possible to address both the economic crisis and the climate crisis at the same time. Economies around the world are in need of stimulus packages; such packages could include investments in renewable energy, smart buildings, smart cities, public transit, and sustainable food and agriculture systems.[47]

Longer commutes and ownership of multiple vehicles are associated with larger footprints; housing policy that accommodates more people living in denser, more transit-accessible parts of the region could have the effect of reducing carbon emissions per household. For instance, in the immediate aftermath of the pandemic, the notion of car-free streets as a way to reduce

[42] https://www.wri.org/news/distance-clean-air-post-covid-19

[43] https://www.unenvironment.org/news-and-stories/story/covid-19-four-sustainable-development-goals-help-future-proof-global

[44] https://www.iisd.org/library/coronavirus-shaping-sustainable-development

[45] https://www.pnas.org/content/116/13/6001

[46] https://www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-global-warming.html

[47] https://www.unenvironment.org/news-and-stories/story/covid-19-four-sustainable-development-goals-help-future-proof-global

emissions in NYC quickly moved to the front burner of the policy debate.[48] At the state level, New York aims to achieve 70 percent renewable energy by 2030, which compares to current energy usage that is 28 percent renewable.[49] At the local level, NYC's Local Law 97 sets carbon caps for buildings starting in 2024 and will require the retrofitting of approximately 50,000 buildings in 10 years. This will create an estimated $20 billion retrofit market over the next decade.[50]

Another trending sustainability goal is to increase the circularity of industries across the city, in order to reduce waste for things like textiles, construction materials, or food. In the coming years, the Biden-Harris administration's climate plans could see increased investments in transit, infrastructure, clean energy, and environmental justice.[51]

Finally, public transit itself is integral to the region's economy, and must be a part of any sustainability discussion. Many of the city's most vulnerable communities rely heavily on public transit. The year 2020 saw an increase in alternative transit choices such as cycling, and in some ways the pandemic provided a blueprint for how a "15-minute neighborhood" could function—a scenario in which residents of a neighborhood can access all of life's daily essentials in a short trip.[52] [53] Nevertheless, this would not lessen the need to maintain and fund robust, citywide public transit services, which allow people to access higher quantities and varieties of jobs, allow the city to accommodate more people, and lessen the dependency on automobiles.

[48] https://www.nytimes.com/2020/05/01/nyregion/coronavirus-streets-closed-nyc.html?referringSource=articleShare

[49] https://www.nrdc.org/experts/cullen-howe/renewable-energy-gets-major-boost-new-york-state-budget

[50] https://www.urbangreencouncil.org/content/news/20b-building-energy-retrofit-market

[51] https://joebiden.com/clean-energy/

[52] https://www.masstransitmag.com/alt-mobility/shared-mobility/bicycle-scooter-sharing/news/21164774/ny-nyc-sees-big-bicycling-boom-in-year-of-covid-according-to-dot-data

[53] https://nymag.com/intelligencer/2020/07/the-15-minute-city-can-new-york-be-more-like-paris.html

Conclusion

The goals of economic and racial inclusion are not independent of economic growth. In fact, interventions that seek to increase economic and racial inclusion can also lead to economic growth and can aid an economic recovery. A 2018 report by the Urban Institute details a number of ways in which policies that promote inclusion have led to stronger economic recoveries in cities around the country. Examples of these policies include education policy that promotes school desegregation, housing policy that creates affordable, high-quality housing in high-opportunity neighborhoods, economic development policy that acknowledges and amplifies the unique contributions of immigrant communities, and tax policy that targets tax incentive programs at distressed neighborhoods.[54]

Many of these interventions are similar to programs that the city already has in place and which it could look to expand. Pursuing an inclusive economic recovery also presents an opportunity for considering innovative progressive policies.[55] The COVID-19 pandemic dealt a crushing blow to the physical, social, and economic health of communities around the world. The recovery will not be immediate, but it does provide an opportunity, globally, to avoid the mistakes of the past. Locally, this means helping those who have been impacted most by the pandemic and ensuring that existing inequalities are not exacerbated. Considering budgetary pressures and limited fiscal space in most jurisdictions, this will require efficiency and innovation.

The city has been forced to be innovative during the pandemic. Historically, keeping businesses open and retaining some of NYC's unique qualities has required both small and large innovations. The City's Essex Market covered the cost of safety procedures for tenants, helped tenants to shift to making sales online, and set aside time specifically for seniors, at-risk customers, and essential workers.[56] In the month of June alone, the City issued over 3,000 permits for restaurants to be able to put tables and chairs on sidewalks and streets.[57]

Museums are able to operate safely by offering timed ticket slots and reducing the number of visitors at a given time. The need for residents to be able to safely interact with the city has prompted many cities to consider how to repurpose space; one solution in NYC has been to increase the supply of bike lanes.[58] The City's Open Streets program closed off 100 miles of streets to automobile traffic, enhancing safety of movement for cyclists and pedestrians.[59] On the federal level, the Biden administration's plan to invest $1.3 trillion in the country's infrastructure over 10 years—creating jobs and facilitating smarter, cleaner growth—also

[54] Urban Institute, "Inclusive Recovery in US Cities." April 2018.

[55] NYC Department of Consumer Affairs, "Student Loan Debt Distress Across NYC Neighborhoods." November 2018

[56] https://www.brookings.edu/blog/the-avenue/2020/08/04/how-a-new-york-city-public-market-is-keeping-a-neighborhoods-third-place-alive-during-covid-19/

[57] https://nextcity.org/daily/entry/new-york-citys-street-vendors-considered-essential-are-adapting-to-covid-19

[58] https://nyc.streetsblog.org/2020/06/24/breaking-city-doubles-temporary-protected-bike-lanes-in-response-to-covid/

[59] https://www1.nyc.gov/html/dot/html/pedestrians/openstreets.shtml

should play a critical role in rebuilding NYC.[60] While the pandemic has raised questions about the livability and logic of NYC, the city is essential to the region and fundamental to the economic success of the US.

NYC has made significant progress since being hit early and hard by the pandemic, but COVID-19 has laid bare the need and opportunity for the city to rebuild—and reinvent—itself with a more inclusive, equitable, resilient, and sustainable economy.

[60] https://joebiden.com/infrastructure-plan/

Appendix

We use the following NAICS codes to define "street-level retail." This definition was originally developed in July 2018.

Street Activity Definition
NAICS 441 Motor vehicle and parts dealers
NAICS 442 Furniture and home furnishings stores
NAICS 443 Electronics and appliance stores
NAICS 444 Building material and garden supply stores
NAICS 445 Food and beverage stores
NAICS 446 Health and personal care stores
NAICS 447 Gasoline stations
NAICS 448 Clothing and clothing accessories stores
NAICS 451 Sports, hobby, music instrument, book stores
NAICS 452 General merchandise stores
NAICS 453 Miscellaneous store retailers
NAICS 454 Nonstore retailers
NAICS 485310 Taxi service
NAICS 487 Scenic and sightseeing transportation
NAICS 512131 Motion picture theaters, except drive-ins
NAICS 519120 Libraries and archives
NAICS 522110 Commercial banking
NAICS 522120 Savings institutions
NAICS 522130 Credit unions
NAICS 5322 Consumer goods rental
NAICS 541940 Veterinary services
NAICS 7111 Performing arts companies
NAICS 7112 Spectator sports
NAICS 7121 Museums, historical sites, zoos, and parks
NAICS 713940 Fitness and recreational sports centers
NAICS 713950 Bowling centers
NAICS 713990 All other amusement and recreation industries
NAICS 722330 Mobile food services
NAICS 7224 Drinking places, alcoholic beverages
NAICS 7225 Restaurants and other eating places
NAICS 81211 Hair, nail, and skin care services
NAICS 812310 Coin-operated laundries and drycleaners
NAICS 812320 Drycleaning and laundry services
NAICS 8129 Other personal services

Appendix II

	New York City Department of City Planning's list of essential NAICS codes
NAICS ID	**Description**
11	Agriculture, Forestry, Fishing and Hunting
22	Utilities
23	Construction
311	Food Manufacturing
3121	Beverage Manufacturing
322	Converted Paper Product Manufacturing
325	Chemical Manufacturing
333242	Semiconductor Machinery Manufacturing
334	Computer and Electronic Product Manufacturing
3391	Medical Equipment and Supplies Manufacturing
42	Wholesale Trade
444	Building Material and Garden Equipment and Supplies Dealers
445	Food and Beverage Stores
44611	Pharmacies and Drug Stores
447	Gasoline Stations
45391	Pet and Pet Supply Stores
454	Nonstore Retailers
481	Air Transportation
482	Rail Transportation
483	Water Transportation
484	Truck Transportation
485	Transit and Ground Passenger Transportation
4881	Support Activities for Air Transportation
4882	Support Activities for Rail Transportation
4883	Support Activities for Water Transportation
4884	Support Activities for Road Transportation
4885	Freight Transportation Arrangement
4889	Other Support Activities for Transportation
491	Postal Services
492	Couriers and Messengers (including local delivery)
493	Warehousing and Storage
515	Broadcasting (except Internet)
517	Telecommunications
518	Data Processing, Hosting, and Related Services
519	Other Information Services
521	Monetary Authorities-Central Banking
522	Credit Intermediation and Related Activities
523	Securities, Commodity Contracts, and Other Financial Investments and Related Activities
524	Insurance Carriers and Related Activities
525	Funds, Trusts, and Other Financial Vehicles
541214	Payroll Services
541219	Other Accounting Services
541614	Process, Physical Distribution, and Logistics Consulting Services
54171	Research and Development in the Physical, Engineering, and Life Sciences
54194	Veterinary Services

551111	Offices of Bank Holding Companies
5616	Investigation and Security Services
56172	Janitorial Services
562	Waste Management and Remediation Services
6211	Offices of Physicians
6212	Offices of Dentists
6213	Offices of Other Health Practitioners
6214	Outpatient Care Centers
6215	Medical and Diagnostic Laboratories
6216	Home Health Care Services
622	Hospitals
6231	Nursing Care Facilities
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly
6241	Individual and Family Services
6242	Community Food and Housing, and Emergency and Other Relief Services
6243	Vocational Rehabilitation Services
6244	Child Day Care Services
72	Accommodation and Food Service
8111	Automotive Repair and Maintenance
8122	Death Care Services
8123	Dry-cleaning and Laundry Services
81291	Pet Care (except Vet) Services
81293	Parking Lots and Garages
921	Executive, Legislative, and Other General Government Support
922	Justice, Public Order, and Safety Activities
923	Administration of Human Resource Programs
92411	Administration of Air and Water Resources and Solid Waste Management Programs
9281	National Security and International Affairs

Diving deeper into the differences between "strict" and "common sense" essential employment in NYC: strict definition

NAICS code & description	NYC essential private establishments	NYC essential private employment
11: Agriculture, Forestry, Fishing and Hunting	57	259
21: Mining, Quarrying, and Oil and Gas Extraction	0	0
22: Utilities	102	1,559
23: Construction	14,702	153,517
31-33: Manufacturing	1,702	21,990
42: Wholesale Trade	14,673	131,483
44-45: Retail Trade	14,907	132,575
48-49: Transportation and Warehousing	4,949	82,441
51: Information	2,729	107,789
52: Finance and Insurance	12,258	330,183
53: Real Estate and Rental and Leasing	0	0
54: Professional, Scientific, and Technical Services	2,475	38,378
55: Management of Companies and Enterprises	0	0
56: Administrative and Support and Waste Management and Remediation Services	3,168	95,488
61: Educational Services	0	0
62: Health Care and Social Assistance	22,837	682,008
71: Arts, Entertainment, and Recreation	0	0
72: Accommodation and Food Services	24,629	367,196
81: Other Services (except Public Administration)	7,086	35,615
Total NYC Private Sector	128,199	2,198,615

NAICS Code & Description	NYC Essential Private Establishments	NYC Essential Private Employment
11: Agriculture, Forestry, Fishing and Hunting	54	202
21: Mining, Quarrying, and Oil and Gas Extraction	0	0
22: Utilities	102	1,559
23: Construction	3,863	44,811
31-33: Manufacturing	1,663	21,639
42: Wholesale Trade	10,443	93,052
44-45: Retail Trade	12,875	111,466
48-49: Transportation and Warehousing	4,440	69,487
51: Information	1,784	66,164
52: Finance and Insurance	9,191	247,637
53: Real Estate and Rental and Leasing	0	0
54: Professional, Scientific, and Technical Services	2,475	38,378
55: Management of Companies and Enterprises	0	0
56: Administrative and Support and Waste Management and Remediation Services	1,604	26,141
61: Educational Services	0	0
62: Health Care and Social Assistance	18,652	649,565
71: Arts, Entertainment, and Recreation	0	0
72: Accommodation and Food Services	18,227	262,240
81: Other Services (except Public Administration)	6,368	33,156
Total NYC Private Sector	93,541	1,682,451

Below we present a list outlining our main departures from Department of City Planning's methodology:

- 1152 – Support Activities for Animal Production: DCP considers this 100% essential (as part of Sector 11 - Agriculture, Forestry, Fishing and Hunting) but this industry includes such non-essential occupations like dog breeders, so ERP considers this industry 50% essential.

- 23 – Construction: DCP considers this 100% essential but ERP does not think 100% of construction is essential under the common sense criteria. ERP considers the construction industries which are related to civil engineering and civil construction as 100% essential but considers 25% of construction related to residential and non-residential properties as essential.

- 325 – Chemical Manufacturing: DCP considers this 100% essential. ERP considers the subindustries related to pharmaceutical and soap/cleaning chemical manufacturing as 100% essential, and the remaining subindustries as 75% essential.

- 334 – Computer and Electronic Product Manufacturing: DCP considers this 100% essential. ERP considers the industries as 75% essential.

- 42 – Wholesale Trade: DCP considers this 100% essential. ERP considers the subindustries related to drugstore and grocery store wholesaling as 100% essential and most other subindustries as 50% or 75% essential.

- 444 – Building Material and Garden Equipment and Supplies Dealers: DCP considers this 100% essential. ERP considers these industries as 25% essential based on adjustments to the construction industry.

- 454 – Nonstore Retailers: DCP considers this 100% essential. The bulk of these workers and businesses are within 4541 - Electronic Shopping and Mail-Order Houses, which ERP also believes to be 100% essential. However, ERP thinks the other two subindustries in this category (Vending Machine Operators, and Direct Selling Establishments) are 50% essential.

- 485 – Transit and Ground Passenger Transportation: DCP considers this 100% essential. However, with schools closed and many taxi drivers reporting underutilization due to low demand, we estimate that, in practice, about 50% of school bus and charter bus employees are "essential" as are about 75% of taxi drivers.

- 492 – Couriers and Messengers (including local delivery): DCP considers this 100% essential. In practice, with reduced local demand conditions, ERP estimates that 75% of these workers are common sense essential.

- 51 – Information: DCP considers much of this industry 100% essential. ERP considers the subfields related to the telecoms industry as 100% essential, but the subfields related to broadcast and internet journalism at about 50% essential.

- 52 – Finance and Real Estate: DCP considers this industry 100% essential. ERP considers the industry about 75% essential to reflect reduced headcount and/or the prevalence and opportunity for many of these workers to work remotely.

- 621 – Ambulatory Health Care Services: DCP considers most of this industry as 100% essential. ERP considers doctor's offices as 100% essential, but dentists as 50% essential.

- 624 – Child Day Care Services: DCP considers most of this industry as 100% essential. ERP considers this industry as just 50% essential due to reduced local demand as many remote workers are keeping their children at home.

- 72 – Accommodation and Food Service: DCP considers this industry as 100% essential. ERP has seen several anecdotes and articles about layoffs, furloughs, and closings in this industry, and considers about 50% of hotel workers and 75% of food service professionals essential.